

have been singularly aided by the very perfect immersion-objectives which M. Nacet was kind enough to place at my disposal.

It is necessary to give a precise explanation of the structure of the arterioles and their mode of distribution.

The tracheæ, as is well known, are composed of two coats: the inner coat forms the envelope of the aëriferous canal; the outer coat, or peritracheal membrane (*peritoneal membrane* of the Germans), surrounds the former envelope, leaving an interval, the peritracheal space. But at the point where the tracheæ penetrate between the muscular fibres, the inner coat disappears, and the aëriferous canal terminates cæcally, whilst the outer coat or peritracheal membrane becomes the wall of the blood-vessels or arterial capillaries. It is not only the spiroid thickening of the inner coat, or spiral filament, that disappears, it is the inner coat itself that stops and suddenly closes the aëriferous canal. In this way we see, starting from a more or less voluminous tracheal stem, very delicate blood-vessels, in larger or smaller number, which divide and subdivide regularly to their extremities.

The blood retained in the peritracheal space remains throughout its course in contact with oxygen; it reaches the capillaries perfectly vivified, and is a true arterial blood. The capillaries are not in communication with venous capillaries; the blood diffuses itself through the tissues, nourishes them, and falls into the lacunæ; the lacunar currents convey it again to the dorsal vessel.

Thus, to sum up, the tracheæ of insects, which are aëriferous tubes in their central portion and blood-vessels in their peripheral part, become at their extremities true arterial capillaries.

XVIII.—*On Aranea lobata, Pallas (A. sericea, Oliv.).*

By T. THORELL*.

THIS large and well-marked Epeirid, which Pallas described and figured in 1772 (in 'Spicilegia Zoologica,' t. i. fasc. 8. p. 46, tab. 3. figs. 14, 15) under the name of *Aranea lobata*, and of which arachnologists have hitherto possessed only doubtful or incorrect notions, is, as the following remarks will render evident, identical with the form known under the appellation *Argiope* l. *Epeïra sericea* (Oliv.), which, by its size and beauty, its unusual aspect, and its general occurrence, attracts notice more than any other species of spider, except

* Translated from the 'Öfversigt af Kongl. Vetenskaps Akademiens Förhandlingar,' 1867, No. 9, by Arthur W. E. O'Shaughnessy.

perhaps the splendid *Argiope Brünnichii**, in the arachnoid fauna of the south of Europe, now even attaining the unknown northern limit of that fauna.

When Pallas published the first or Latin edition of his above-named work, he was ignorant of the habitat of *A. lobata*, and unfortunately advanced a supposition that the species was probably the same as Petiver's *Araneoides Cap. fasciata lutescens*, &c.†. It is, beyond a doubt, this circumstance only which has caused later writers to overlook the correspondence of Olivier's *A. sericea* and Pallas's *A. lobata*; for, although the description and figures which Pallas has left are not particularly well marked, they are sufficiently accurate to enable any one looking at them with unprejudiced eyes to recognize in *A. lobata* its identity with *A. sericea*.

We have only to recollect that the examples which Pallas had before him were preserved in spirit: in such examples the silky down which covers the body is not apparent, whereas one easily perceives the two dark longitudinal bands and the large black transverse spots in front of the petiolus conspicuous in Pallas's representation, as also the "lineæ bis geminæ fuscæ supra apicem abdominis subtrilobum longitudinales" of which he speaks, which marks are, on the contrary, in living or dried examples, more or less hidden by the silk-like covering of hair.

Pallas states (*loc. cit.*) that he met with several specimens of his *A. lobata* "in Museo Academiæ Petropolitanae:" probably they came from Southern Russia, where this spider had been already found in 1768 by Lepechin. His "Aranea senoculata thorace depresso, abdomine exovato globoso lobato, punctis in dorso 4 nigris"‡ (which received from Gmelin, in Linn. Syst. Nat. ed. 13, the name *A. argentea*), is in fact indisputably nothing else than a variety of the common *A. sericea*, which also was later observed in South Russia (Crimea) by Al. v. Nordmann§.

But, should there yet remain, in spite of the agreement of the two descriptions, any doubt as to the European origin of

* *Aranea Brünnichii*, Scop. (Annus V. Hist.-Nat.: 1772) = *Aranea fasciata*, Oliv. (1789) l. *Epeira (Nephila) fasciata* Auct. rec.

† Petiver, 'Gazophylacium Naturæ et Artis,' i. tab. 12. f. 11; Catalogus classicus et topicus, p. 3, No. 440.

‡ Lepechin, 'Tagebuch der Reise durch verschiedene Provinzen des Russischen Reiches in den Jahren 1768 u. 1769.' Uebers. von C. W. Haase. Th. i. p. 316, Taf. 16. fig. 2 (1774). (The first part of the Russian original was printed in 1771).

§ "In the Crimea I have sat for a whole hour opposite the web of the beautiful *Argyopes sericeus*, the large female in the centre, the small male at the edge of the wide-meshed web."—Nordmann, "Erstes Verzeichniss der in Finnland und Lappland gefundenen Spinnen, Araneæ," in Bidrag till Finlands Naturkännedom, Etnografi och Statistik, viii. p. 18 (1863).

A. lobata, and its identity with *A. sericea* which is dependent upon that fact, it will be sufficient and conclusive to consult the German edition of the Spicil. Zool. fasc. 9, translated and revised by Pallas himself, and printed in 1777 under the title 'Naturgeschichte merkwürdiger Thiere,' 9te Sammlung, pp. 71, 72. From the account therein given of *A. lobata* we extract the following:—

" the true country of the spider the description of which I have already furnished from preserved specimens. . . . I have met with it in the warm southern parts about the Wolga, and on the Upper Irtisch, and have indeed found it already perfectly developed in the month of May. . . . It has also been noticed by my lamented friend Prof. Falk in the corners of houses in Zariczan; and Prof. Lepechin, who has described and figured it in the first part of his Russian Voyage (p. 395, pl. 16. fig. 2), found it under the hollow bark of a tree, brooding over its eggs" (*loc. cit.* p. 72).

Thus we find,—first, that Pallas expressly gives the south of Russia (both in Europe and Asia) as the country of *A. lobata*; and, secondly, that, according to Pallas, Lepechin's above-named *Aranea* ("abdomine lobato," &c.) is the same species as the *A. lobata*, Pallas.

Both Pallas and Nordmann in the above-cited passage give us every reason to suppose that this species is as far from being one of the rarer forms of spider in the south of Russia as it is indeed in Italy and the south of France.

Attention having been once called to the matter, no one would henceforth think of believing Pallas's *A. lobata* to be the same as Petiver's "*Araneoides capensis*" from the Cape of Good Hope; also Olivier's specific name *sericea* must give place to the much older one of *lobata*, and the species be henceforth known as *Argiope lobata* (Pallas).

Fabricius adopts *A. lobata* in the 'Species Insectorum' (1781), after Pallas (Spicil. Zool.); and while he cites this author, he includes also, but with a query, Petiver's species from the Cape among the synonyms, doubtless on the ground of Pallas's previously hazarded guess concerning the habitat of *A. lobata*. He does the same in the 'Mantissa Insectorum' (1787). For the *habitat* of the species, Fabricius, in both these works, has candidly left a blank. But some years later (1793), in the 'Entomologia Systematica' (tom. ii. p. 407), while giving the same diagnosis and synonymy for *A. lobata* as in the 'Species Insectorum,' he says, "Habitat ad Caput Bonæ Spei," showing that he now abandoned his former uncertainty as to the country of this species, and, of his own accord, regarded it as exclusively exotic—an assumption

which has been admitted ever since*. We see, however, from this that Fabricius had no knowledge of Pallas's *A. lobata* beyond that which he derived from the Spicil. Zool., and moreover that he was as unacquainted with the above-cited passage in Pallas's 'Naturgesch. merkw. Thiere' as any one of the various authors who have occupied themselves with Olivier's *A. sericea*.

Walckenaer (Hist. Nat. d. Ins. Apt. p. 117) believes, curiously enough, that the true *Ep. sericea* does not belong to the European fauna. This is the more unaccountable, from the fact that Olivier, who first described this spider under the specific name *sericea*, expressly says that he found it "frequently in Provence." Walckenaer nevertheless accepts as properly a European species the *E. dentata* (Risso), differing from *A. sericea* merely in markings, which, coming from Nice, is consequently from almost the very same region (south of France) where Olivier found his *Aranea sericea*! Walckenaer seems to be as little acquainted from personal observation with *E. dentata* (his description of it is a mere extract from Risso) as with any European example of *A. sericea*.

The specimens of the species in question, however, which I have seen, and which I collected in Italy in the tracts about Naples, where Costa also found "*Epeira sericea*"†, agree perfectly not only with Pallas's *A. lobata*, but also with the descriptions and figures which Olivier, Latreille, Walckenaer, and Audouin have left us of *A. (E.)-sericea*. They lack the markings which belong to "*E. dentata*" according to Risso's (and Walckenaer's) representation of that form, which, however, is certainly only a colour variety of "*E. sericea*" l. *lobata*.

To "*E. dentata*" Walckenaer rightly refers Lepechin's above-named "*Aranea* (. . . abdomine . . . lobato, &c.)" (*A. argentea*, Gmel.), which, as we have already seen, is allowed by Pallas himself to be identical with his *A. lobata*; here also should undoubtedly be referred *Argyopes praelautus*, Koch, from Turkey (tracts of the Balkan), as Walckenaer has supposed.

* Walckenaer says (Hist. Nat. d. Ins. Apt. ii. p. 116), with reference to *Epeira argentata* (Fabr.), "Conférez pour cette espèce Pallas, 'Spicilegia Zoologica,' fasc. 9. p. 46, tab. 3. figg. 13 et 14" (it should be "14 & 15")—that is to say, the descriptions and figures of *A. lobata*, which, however, do not in the least agree with Walckenaer's description of *E. argentata*, but do agree very well with that which he gives of *E. sericea*. *E. argentata*, moreover, comes from America ("India," Fabr.).

† O. G. Costa, 'Cenni zoologici ossia descrizione sommaria delle specie nuove di animali scoperti in diverse contrade del regno nell' anno 1834,' p. 16 (1834).

The most important synonyms of this remarkable species, which is spread over the whole of Southern Europe, from Spain in the West to Southern Russia in the East, Southern Siberia, Northern Africa (Egypt, Algeria*), and which has even been observed in the Cape Verde Islands and in Senegal, should be as follows:—

Argiope lobata (Pall.) 1772.

Var. *α*, sive *forma principalis*.

- Syn. *Aranea lobata*, Pallas, Spicil. Zool. i. fasc. 9. p. 46, tab. 3. figg. 14 et 15 (1772).
 ———, Pallas, Naturgesch. merkw. Thiere, i. 9te Samml. p. 71, pl. 3. figg. 14 et 15 (1777).
 ———, Fabr. Spec. Insect. p. 536 (1781).
 ———, Gmel. Linn. Syst. Nat. ed. 13. t. 1. pl. 5, p. 2955 (1789?).
 ——— *sericea*, Oliv. Encycl. Méth. iv. pp. 188 et 198 (1789).
Epeïra sericea, Latreille, Gen. Crust. et Ins. i. p. 107 (1806).
 ———, Hahn, Die Arachn. i. p. 8, fig. 4 (1831).
 ——— Walck., Hist. Nat. d. Ins. Apt. ii. p. 116 (1841).
 ——— *margaritacea*, Risso, Hist. Nat. d. princip. Product. de l'Europe mérid. v. p. 40 (1826).
Argyope sericea, Sav. et Aud. in Descr. de l'Égypte, ed. 2. xxii. p. 334, pl. 2. fig. 6 (1827).

Var. *β*.

- Aranea argentea*, Gmel. Linn. Syst. Nat. ed. 13. t. i. pl. 5, p. 2959 (1789?).
Segestria dentata, Risso, Hist. Nat. d. princ. Prod. de l'Europe mér. v. p. 161 (1827).
Epeïra dentata, Walck. Hist. Nat. d. Ins. Apt. ii. p. 118 (1841).
Argyopes prælautus, Koch, Die Arachn. v. p. 37, fig. 359 (1839).

In conclusion, I would say a few words respecting the generic name *Argiope*, which is usually written *Argyope* or *Argyopes*. Both in the passage in the 'Description de l'Égypte,' where the genus is characterized by Audouin (t. xxii. p. 328, in ed. 2), and in the index to the same part (p. 466), the Latin name employed is *Argiope*; but in French it is *Argyope* ("Genre ARGYOPE, *Argiope*," just as Audouin writes elsewhere "Genre TÉGÉNAIRE, *Tegenaria*," "Genre PHOLQUE, *Pholcus*," "Genre FAUCHEUR, *Phalangium*," &c.). Later, in describing the species, he has used this latter form of the word, not only for the French, but also for the Latin name. However, as Audouin *first*, and *in characterizing the genus*, wrote *Argiope*, and as this is moreover the only correct orthography (the name is in fact formed from Ἀργιόπη, nom. prop. myth. femin. gen.), it should be retained through the

* Probably also over the eastern maritime countries of the Mediterranean. In Syria occurs an allied form, *Argiope splendida*, Sav. & Aud., which is possibly not specifically distinct from *A. lobata*.

rejection of the barbarous *Argyope*, which has obtained currency with Lucas, Walckenaer and others. Latreille* has changed it (on what grounds I know not) to *Argyopes*, making it a masculine; and he is followed by Sundevall, Koch, Keyserling, and others. It is desirable that the genus should henceforth resume its original and correct name—*Argiope*, Sav. & Aud.

XIX.—*Observations on some of the Heliotropiæ.*

By JOHN MIERS, F.R.S., F.L.S., &c.

[Concluded from p. 133.]

MESSERSCHMIDTIA.

The late Mr. Robert Brown (in 1810) pointed out the necessity of constituting a distinct genus for those species of *Tournefortia* which differed from all the others in having the border of the corolla cleft into subulate lobes, a baccate fruit containing four nucules (each unilocular and monospermous), the seed with a very curved embryo and a superior radicle (Prodr. p. 496); but he omitted giving a name to the genus. In 1819 Römer and Schultes adopted this view, calling the genus *Messerschmidtia*, a name previously given by Linnæus to those species of *Tournefortia* which have a fruit with two nucules, each 2-celled. As such characters, according to their showing, belonged to *Tournefortia* proper, the *Messerschmidtia* of Linnæus naturally fell to the ground. Adopting it, therefore, for the group in question, they enumerated eleven species, all natives of the New World, mostly climbing or subscandent plants; but it is strange that among these there appears only one species that answers to the essential characters of their own generic diagnosis. G. Don (1837), following the same train, amplified the species to twenty-four, in total disregard of the distinguishing features of *Messerschmidtia*, associating with them several belonging to *Heliophytum*. Endlicher (1838) acknowledged the genus, and gave it a tolerably correct diagnosis, though with some few errors. By some authors the name has been applied to other very different groups, selected from *Tournefortia*; and this has caused no little confusion. DeCandolle, in his elaboration of the *Borraginææ* (in 1845), quite ignored *Messerschmidtia* as a genus, admitting neither that of Linnæus nor of Römer and Schultes; but he retained this name, as a section, for a small number of species of *Tournefortia* possessing very different characters (Prodr. ix. 528).

* Cuvier's Règne Animal, nouv. éd. iv. p. 70 (1829).